REMARKS

This Amendment is submitted in response to the Office Action mailed on September 30, 2005. Claims 1 - 12 are pending, with claims 1 - 6 standing allowed, and the remaining claims standing rejected at present.

Claims 13 - 18 are added. No fee is due.

Support for claims 13 and 14 is found in Figure 36 of the Specification, and other places. Support for claims 15 - 18 is found in the Specification, paragraph 95 et seq., and other places.

RESPONSE TO DOUBLE-PATENTING REJECTION

Applicants acknowledge the double-patenting rejection, and will respond at the proper time.

RESPONSE TO 103 - REJECTIONS

Claims 7 - 9 were rejected as obvious, based on Dooley and either Klimstra or Owens.

Claims 7 and 9

<u>References are Physically Impossible to Combine
Thus, No Expectation of Success can be Shown</u>

Applicants point out that Dooley states that his cables 18 and 19 are shielded, coaxial cables. Those cables feed power to the

igniters 16 and 17.

Klimstra shows a coil 8. However, that coil is adjacent the "insulated **SINGLE** wire lead 4." (Column 6, line 23.) That lead 4 is not shielded.

It is not possible, or at least the PTO has not shown how it is possible, to place Klimstra's coil 8 around the corresponding wire in Dooley, because the shield 18 is in the way.

A similar comment applies to Owens. Owens' detector 30 is adjacent the single, unshielded wire 32. The PTO has not shown how Owens' detector 30 can be placed adjacent the corresponding wire in Dooley.

Thus, no expectation of success has been shown, indicating that the combination of references actually works.

MPEP § 706.02(j) states:

> Contents of a 35 U.S.C. 103 Rejection
>
> . . .
>
> To establish a prima facie case of obviousness, three basic criteria must be met.
>
> . . .
>
> Second, there must be a reasonable expectation of success.
>
> . . .
>
> The . . . reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure.

Restated, Klimstra and Owens teach placing the pick-up **adjacent** the wire carrying the current to be detected, with no intervening shielding present. The PTO has not shown how the teachings of Klimstra and Owens can be successfully followed, even if applied to Dooley.

Combination of References is Inoperative
Thus, Again, No Expectation of Success Shown

Applicants' Specification, paragraphs 87 - 94 for example, explains that good arguments exist which show that a coil, such as Klimstra's coil 8, cannot detect current in Dooley's coaxial cables. One reason is that the current flowing along the central wire of the coaxial cable cancels the returning current, which leaves the igniter, and flows along the shielding.

That is, a current flowing to the left may be defined as a **positive** current. A current flowing to the right would thus be defined as a **negative** current. If the two currents are equal in magnitude, then their algebraic sum would be **zero**.

Thus, no **NET** current is present within Dooley's coaxial cable.

Consequently, Klimstra's coil 8 will detect no net current in the coaxial cable, even though current may be present in the central wire. A similar comment applies to Owens.

Therefore, Applicants submit that the PTO is required to present a line-of-reasoning explaining how the Klimstra/Owens

detector successfully detects the current in Dooley's central wire in the coaxial cable, which central wire is surrounded by grounded shielding.

After all, one purpose of the shielding is to prevent stray signals from reaching the central wire. By the Reciprocity Theorem of antenna theory, that same shielding prevents signals **on the central wire** from radiating outward. The shielding is bi-directional.

Demonstration that Combination of References is Inoperative

The undersigned attorney prepared a Response to an Office Action in co-pending application 10/775,887, Art Unit 2858, handled by Examiner Anjan K. Deb, which application was filed on February 10, 2004.

In connection with that Response, one of the Inventors herein, namely, Robert Ponziani, performed an experiment wherein he attempted to detect a signal in a gas turbine igniter, but using a standard automotive timing light, having a magnetic pick-up of the type schematically indicated in Klimstra.

The timing light failed to detect the signal. APPENDICES A and B, attached hereto, are copies of documents submitted to the PTO in connection with the Response. APPENDIX A describes the experiment. APPENDIX B explains the term "ground bypass" in APPENDIX A.

Therefore, Applicants submit that this experiment indicates that the combination of references would be inoperative.

No Teaching Given for Combining References

The Office Action, page 4, lists elements of the claims supposedly found in the references. Then, in the second-to-last sentence of section 6, the Office Action states, "[It is obvious] to employ a current detector, to detect the presence of spark."

However, that is not a teaching in favor of combining the elements listed immediately prior to that statement.

Nor is that a teaching for combining those elements as recited in the claims.

Further, that statement merely sets forth a concept contained in Owens and Klimstra, namely, that detecting current may indicate the presence of spark. That is not a teaching that the approaches of those two references should be applied to the gas turbine engine in Dooley.

Dooley Already Detects Current, but in Different Way

Dooley's Figures 7B and 8B are clearly line-drawings derived from oscilloscope plots. Dooley states that those Figures show current flowing in the igniter 16 of his Figure 4. (Eg, column 5, line 36.)

Plainly, Dooley connected his oscilloscope at the leads

labeled "VOUT TO THE IGNITOR VIA THE CABLE" in his Figure 5. (One reason is that it is impossible to connect directly to the igniter during operation, because the ignitor is located within the combustor, and the high temperature would melt the oscilloscope leads.)

Therefore, Dooley already shows a system for detecting current in the igniter.

Dooley's system is different from that claimed.

Further, any alteration of Dooley's system is a modification of Dooley, which is prohibited by the MPEP. MPEP § 2143.01 states:

> THE PROPOSED MODIFICATION CANNOT RENDER THE PRIOR ART UNSATISFACTORY FOR ITS INTENDED PURPOSE.
>
> . . .
>
> THE PROPOSED MODIFICATION CANNOT CHANGE THE PRINCIPLE OF OPERATION OF A REFERENCE.

Modification of Dooley Creates Needless Redundancy

Applicants point out that adding the pick-up of Klimstra or Owens to Dooley now adds a redundant element.

As explained above, Dooley already detects igniter current. Addition of the Klimstra/Owens pick-up serves no purpose.

Further, if those pick-ups are not added, but **substituted** for Dooley's oscilloscope, then Dooley is rendered inoperative. How does his oscilloscope then detect the voltage for his Figures 7A and 8A ?

Claim 8

Claim 8 is considered patentable, based on its parent.

In addition, Applicants respectfully submit that the PTO is not correctly evaluating claim 8.

The Office Action, in essence, is asserting that claim 8 is an obvious "addition" to parent claim 7.

MPEP § 2141.02 states:

> In determining the differences between the prior art and the claims, the question under 35 USC 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious.

The PTO is asserting that the **difference itself** (notifying the pilot) is obvious. But, as this MPEP section points out, that is not the question.

The question is whether claim 8, and its parent claim 7, **as a whole**, are obvious.

ADDED CLAIMS

Claim 13 states that the detector is located where the housing surrounds the igniter. The references, even if combined, do not show that.

Claim 14 states, in simple terms, that the detector is at the

housing. The references, even if combined, do not show that.

Claims 15, 17, and 18 state that the current in the shield does not cancel that in the cable. The references, even if combined, do not show that.

Claim 16 states that the return current follows another path besides the shield. The references, even if combined, do not show that.

Significantly, claims 15 - 18 state that a **net** current is present within the shield. Thus, the net current can be detected.

CONCLUSION

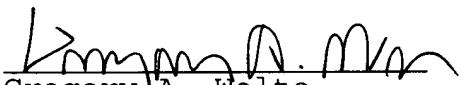
Applicants requests that the rejections to the claims be reconsidered and withdrawn.

Applicants expresses thanks to the Examiner for the careful consideration given to this case.

Applicants infer that, since claims 10 - 12 have not been rejected based on the prior art, they will be allowable if a terminal disclaimer is filed. Such a disclaimer will be filed in due course.

Applicants express thanks for the allowance of claims 1 - 6.

Respectfully submitted,



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ATTACHED: APPENDIX A (2 pages)
APPENDIX B (1 page)

Ignition Spark Sensor Invention – Additional testing using an Automotive Timing Light as Sensor.

Robert Ponziani, one of two inventors of subject patent application.
May 27, 2005

Test Setup

Test Conducted on May 25, 2005.

A Craftsman Automotive Inductive Timing Light Model # 161.213400 was selected for the test. There were no serial numbers present on the unit. The sensor end, or "pick-up", is an inductive coil device with a light metallic core, and resides in a spring-loaded clamp that is normally clipped around and surrounds the electrical lead to an automotive spark plug. When the clamp ends make contact as the clamp is closed, the unit will provide maximum signal strength to the electronics in the main body of the timing light.

It was initially tested on an automobile, which verified that it was in working condition. This unit was then used as part of the test set-up in a gas turbine development ignition lab. A standard gas turbine ignition set-up was constructed, which included the important ground bypass discussed in the patent application, and the subject timing light was installed.

The timing light power input lead was energized with a 12-volt DC voltage source as required, set to 12.5 volts DC, and measured to verify the voltage value. The inductive sensor clamp was installed over the gas turbine ignition lead, but due to the much larger gas turbine ignition lead diameter, the sensor clamp would not fully close around the gas turbine ignition lead. This concern is addressed below.

Tests Conducted and Results

1) The gas turbine ignition system was energized, which produced the standard 2 sparks per second at the igniter tip. The timing light trigger switch was pulled, and no light output indications occurred from the timing light.

2) A piece of non-magnetic steel was inserted into the sensor lead clamp to bridge the approx 3/8" gap in the open end of the clamp. This allowed the maximum signal strength available to go into the timing light. Again, the timing light trigger switch was pulled, and no light output indications occurred.

3) The above two tests were each repeated, with the same results that there were no output indications from the timing light.

Conclusion

The results show that using the automotive timing light method is not useful for gas turbine ignition systems. There are substantial differences between the two ignition

APPENDIX A

systems, but the reasons why the automotive timing light is not compatible with the gas turbine ignition system were not investigated.

There are a few *possible* reasons, such as incompatible signal conditioning circuitry inside the timing light, signal suppression from the heavy braided grounding shield on the outside of the gas turbine system that is not used on the automotive system, smaller capacitance in the timing light's signal conditioner, or other circuit incompatibilities such as signal protection circuitry that reacts to the high current flow from the gas turbine system.

For whatever reason, the automotive timing light was not found usable for detecting spark events from a gas turbine ignition system.

Robert Ponziani 5/27/05

Robert Ponziani, Licensed Professional Engineer
May 27, 2005

APPENDIX A

TO 7105-101-1000

"Ground bypass" refers to the following. One ground path can follow the shielding of the cable, as indicated by path R2 in Figure 22 of the Specification. In addition, another path is available, namely, a path R1 through the engine as a whole. This latter path is referred to as "ground bypass," since it bypasses the path R2 through the shielding.

June 13, 2005

APPENDIX B